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System Testing

[Test Main](#)
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Purpose:

The purpose of system testing is to test the entire system as a whole. The emphasis is on verifying end-to-end workflows and scenarios. All external interfaces should be tested. See also [external interface testing](#).

Some contracts do not permit State visibility into system testing (such as when some of the software is COTS). The text below assumes the State does have visibility into this testing phase. **Note:** System testing of COTS should be performed to ensure all components work correctly and in accordance with the specifications and design.

Assumptions/Pre-Conditions:

The test organization should have completed unit, functional, and integration testing successfully and all critical errors should have been addressed. An updated version of the code should have been delivered to the Configuration Manager.

Expectations:

- The primary emphasis is verification of the system as a whole. Typically this means verifying all hardware and software requirements from a business workflow perspective. There should be a minimal number of errors and no critical errors in this test phase. If there are, it may indicate a lack of readiness to proceed.
- This serves as the final verification of requirements and design (for those items that can be tested at this time; some requirements are monitored throughout the life of the contract).
- Correct operation of [external interfaces](#) must be verified. This may require coordination with other departments, agencies or companies.
- Some performance tests may be conducted and used to model or extrapolate behavior.
- All affected documentation should be updated to reflect fixes and changes, including in-line code comments and unit/module/function headers, design documents, user manuals, help desk procedures or bulletins, and help files. Training materials should be finalized during this phase.
- If there were any non-testable requirements, they should be verified at this time. This may include difficult code paths, or such things as the help desk, training materials, etc.

Responsibilities:

- Creation of Tests - Developer or Tester
- Execution of Tests - Tester
- Approval of Test Results/Exit Decision (depending on level of State visibility) - Development Manager, Test Manager, QA Manager, Configuration Manager, State Project Manager
- For a complete list of roles and responsibilities, refer to the [Responsibility Assignment Matrix \(RAM\)](#) (MS Word)

Environment:

System Test Environment

Type of Data:

Real data - data which was processed on the legacy system and is now being re-used for testing

Exit Decisions:

- Refer to the [general test exit/acceptance criteria](#).
- **Checkpoint Decision:** Is the system ready for Acceptance Test (if this is a new system) or Regression Test (if the system is in M&O)?

References:

- IEEE Standard [829-1998](#), Standard for Software Test Documentation (link to pdf)
- IEEE Standard [1012-1998](#), Standard for Software Verification and Validation, Table 1, Section 5.4.5 within table (the tables appear prior to the annex) (link to pdf)
- Archived IEEE Standard [1059-1993](#), Guide for Software Verification and Validation Plans, Sections 4.2.4 and 5.5.6 (link to pdf)

Samples:

- [CWS/CMS System Test Exit Report](#) (MS Word)
- [System Test Plan](#)

System Development Contractor Oversight

Responsibility Assignment Matrix

Milestone #6 – System Qualification Test Completed/Approved

Column 1 lists the expectations for the phase. The remaining columns indicate the expected reviewers (for the Deliverables and Interim Work Products section), or the participants (for the Activities/Decisions and Reviews/Meetings section).

Legend:

P – Primary Responsibility

S – Support Discussions/Activity, as needed

R – Reviewer

A - Approver

I – For Information Only

Note: This matrix assumes that the Prime Contractor has primary responsibility for System Testing, and that the project office has some visibility into the process. For M&O projects, the Prime Contractor can be interpreted to be either project or contractor testing staff.

MILESTONE EXPECTATIONS	PROJECT OFFICE MGMT	PROJECT OFFICE CONTRACT MANAGER	PROJECT OFFICE SYSTEMS ENGRING	PROJECT OFFICE QUALITY ASSURANCE	PROJECT OFFICE IMPLMNTN TEAM	PROJECT OFFICE BUSINESS/ INDUSTRY CONSULTANTS	PROJECT OFFICE LEGAL SUPPORT	STAKEHOLDERS/ USER REPS	INDEPENDENT VERIFICATION AND VALIDATION	PRIME CONTRACTOR
<i>Deliverables¹</i>										
System Test Materials (procedures, scripts, cases, data, etc.)	A		R or P	R	R	R or P			R	P or S
System Test Report	A		R or P	R	R	R		I	R	P or S

¹ Final versions of deliverables required for exit of this phase.

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Listing of Trouble Tickets/Problem Reports and Action Plans	I		R	R	R	R			R	P
Training Materials	A		R	R	R	R			R	P
User Acceptance Test Plan	A		P	R	R	R		S	R	P or S
User Acceptance Test Materials	A		S	R	R	R		P	R	P or S
User Acceptance Test Report	A		P	R	R	R		S	R	P or S
Software Version Description	A		R	R	R				R	P
Hardware Bill of Materials	A		R	R	R				R	P
User Manuals	A		R	R	R	R			R	P
System Administration Manuals	A		R	R	R	R			R	P
Maintenance and Operations Manuals	A		R	R	R	R			R	P

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Help Desk Procedures	A		R	R	R	R		I	R	P
Updated Workplan	A		R	R	R	R			R	P
Updated Implementation Workplan	A		R	R	R	R			R	P
Updated Data Conversion Workplan	A		R	R	R	R			R	P
Updated Capacity/ Performance Model	A	I	R	R	R	R			R	P
<i>Interim Work Products²</i>										
Updated Code/Unit Test Materials (if applicable)	A		R	R	R	R			R	P
Updated Design Documentation (if applicable)	A		R	R	R	R			R	P
<i>Activities/Decisions</i>										

² Deliverables which may be in draft form at exit of this phase or which will be expanded in a future phase based on further information (e.g.: preliminary plan vs. final plan).

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Verify assumptions for the phase are still valid.	A	I	S	S	S	S	S	S	R	P
Validate the Capacity/ Performance Model assumptions and calculations.	A		R	R	I	R		I	R	P
Re-validate Deliverable Expectation Documents prior to vendor beginning work on each deliverable.	A	P	P	R	R	R		R	R	R
Verify traceability of the requirements to the tests and requirements tool.	A		R	R					R	P

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Review the results of the maintenance and operations, and system administration tests. Ensure the maintenance staff are adequately trained and sufficient knowledge transfer is occurring.	A	I	S	R	R	R		R	R	P
Review the approach and strategies for user acceptance testing with the participants and any observers.	P	I	P or S	R	R	R	I	S or R	R	S or P
Perform stress and throughput tests.	A		P or S	R		R		S or R	R	S or P
Verify the help desk plans and procedures.	A		R	R	R	R		R	R	P
Verify management reports are adequate.	A		S	R	R	R		R	R	P

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Verify end-of-month and end-of-year reports and close-out processing conform to anticipated times and processing windows.	A		P or S	R	R	R		S or R	R	S or P
Verify download/-distribution processes and timeframes conform to anticipated times and processing windows.	A		P or S	R	R	R		S or R	R	S or P
Verify batch processing completes in anticipated times and allows for moderate growth.	A		P or S	R	R	R		S or R	R	S or P

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Perform what-if tests and exercise common error paths.	A		S	R		R		P	R	P
Establish help desk and verify help desk and customer service center processes are in place and working.	A		R	R	R	R		I	R	P
Oversee change control process to address problems and fixes identified as a result of testing.	P		R	R					R	P
Perform capacity and performance tests based on updated user transaction profile.	A		P or S	R	R	R		S or R	R	S or P
<i>Reviews/Audits</i>										

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Deliverable Review Meetings (see participants for each deliverable listed above)	P						S		R	P
System Test Meetings			S	S	I	S		(S)	I	P
QA/CM Audit	A	I	S	S	I				R	P
User Acceptance Test Readiness Review Mtg (mini-milestone)	A	I	S	S	I	S	S	S	R	P
User Focus Groups/- Evaluations	P		S	S	S	S	S	P	S	
QA/CM Audit	A	I	S	S	I				R	P
Phase Closeout/- System Acceptance Decision Meeting	A	S	S	S	S	S	S	S	R	P